Flathead County Mosquito Control District

Proposed Pesticide Discharge Management Plan: 2023

Contents

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Pesticide Discharge Management Plan
Flathead County Mosquito Control District

Summary of Proposed Changes, 2023

In accordance with the requirements of the Montana Pesticide Discharge Elimination System General Permit administered by the Montana Department of Environmental Quality, the Flathead County Mosquito Control District must conduct an annual review of its Pesticide Discharge Management Plan (PDMP) and submit each annual revision to the Flathead County Board of Health for approval. The district proposes the following changes be adopted and approved for the 2023 PDMP.

1. **Footer:** Amend the revision date upon approval.

2. **Page 2, Item 1, Pesticide Discharge Management Team:** Delete "Jake Rubow" from 1.a., 1.b., 1.c, 1.d., add "Brock Boll" to 1. a., and "Dave Nixon" to 1.b., 1.c., 1.d. to reflect current personnel.

3. **Page 5, Section 3. c. Aerial Operations:** Delete 1st paragraph of aerial operations entirely from the Pesticide Discharge Management Plan. 2nd paragraph, keep only what states "The Flathead County Mosquito Control District operates a Phantom 4 Pro small UAS for the purpose of monitoring flooding, examining the condition of known mosquito production sites, and locating production sites in areas of mosquito activity. All aircraft are registered with the FAA, and all operations comply with FAA and airspace requirements". The rest is no longer current, and redundant.

4. **Page 5, Section 3. d. General Statement:** Update the AMCA Best Practices for Integrated Mosquito Management description to reflect the most recent, 2022, version.

Draft of Proposed Edits

Pesticide Discharge Management Plan
Flathead County Mosquito Control District

Mailing address: Flathead County MCD
1035 1st Ave West
Kalispell, MT 59901

Phone: 406-751-8140
406-751-8145

Summary: This Pesticide Discharge Management Plan has been written to comply with the requirements imposed by the Sixth Circuit Court January 9, 2009, decision to vacate the Environmental Protection Agency's (EPA) 2006 National Pollutant Discharge Elimination System (NPDES) Pesticides Rule in National Cotton Council of America v. EPA, 553 F.3d 927 (6th Cir., 2009). Therefore, pesticide applications require permits under NPDES programs in all state and federal permitting programs. The Montana Department of Environmental Quality (DEQ) has issued a permit for pesticide 'discharge'. This permit imposes certain reporting requirements, which include the formulation of a pesticide discharge management plan that must be made available to the public upon request under the Freedom of Information Act.

Plan Organization (by page number)

1. Pesticide Discharge Management Team

1. a. Person responsible for managing pests:

Jake Rubow

1. b. Persons responsible for developing and managing PDMP:

Jake Rubow
Brock Boll
Flathead City-County Board of Health

1. c. Persons responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements:

Jake Rubow
Brock Boll

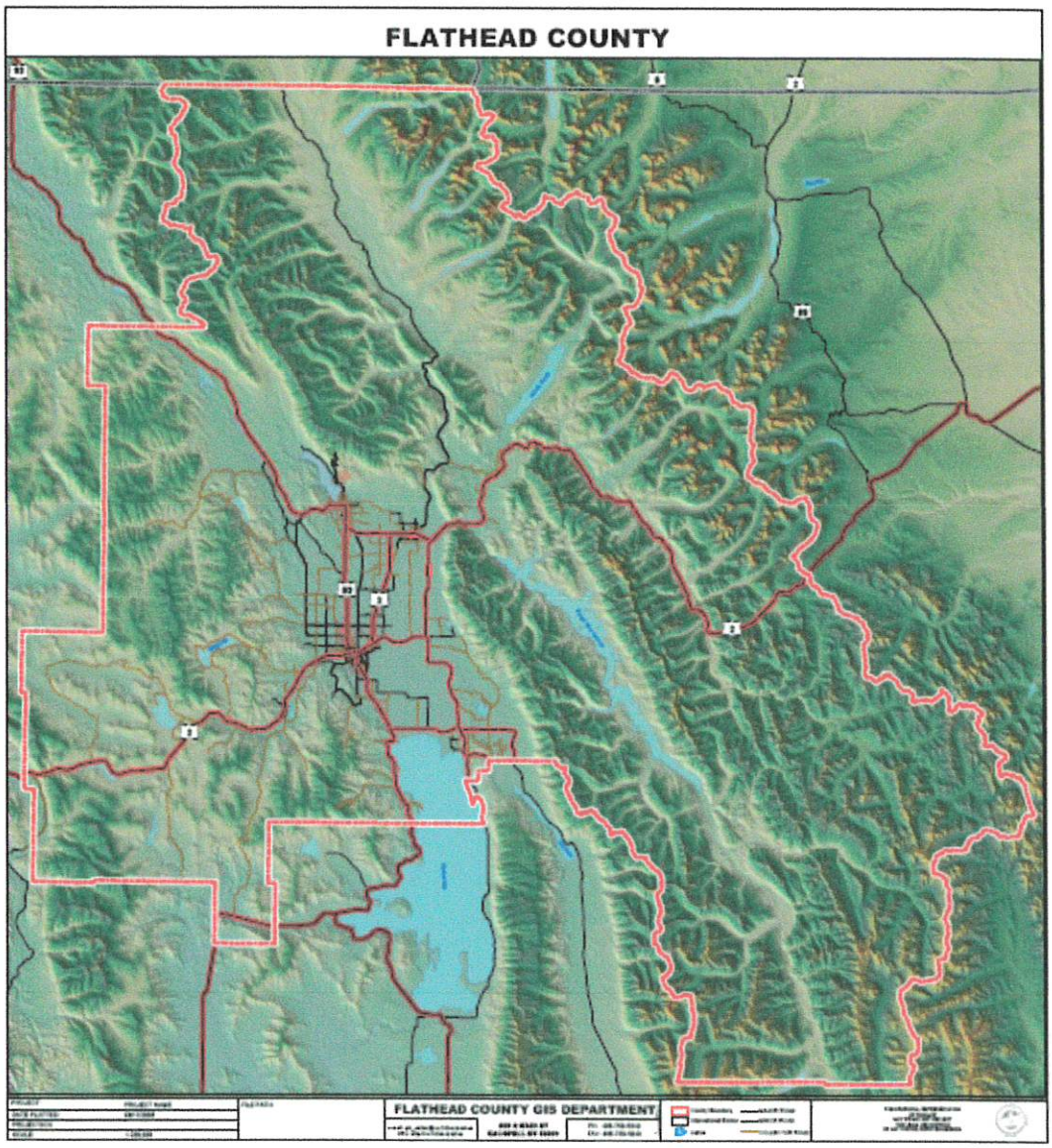
1. d. Persons responsible for overseeing pesticide applications:

Jake Rubow
Brock Boll

2. Pest Management Area Description and Habitats

2. a. Flathead River and Management Areas

The Flathead County Mosquito Control District was created August 3, 2005, by the Board of Commissioners' adoption of Resolution # 1849B. Boundaries for the District include all of Flathead County with the exception of Glacier National Park, United States Forest Service Property and private property that owners have specifically requested be excluded from control activities.



Flathead County is trisected from North to South by three primary rivers: the Flathead River, the Whitefish River, and the Stillwater River. The Swan River enters Flathead County from the South, meanders west and enters Flathead Lake at Bigfork. Smaller creeks include Ashley Creek, Trumble Creek, Patrick Creek and Spring Creek.

Spring snowmelt affects river and creek levels at different times, frequencies, and rates. Localized spring rain and snowfall can raise river and stream levels quickly. Typically, high water crests in early June. As Flathead Lake nears full pool, the main stem of the Flathead River backs up to the confluence with the Stillwater River, spilling water into low-lying areas of the lower valley. During periods of high ground water with above average snowpack, low areas throughout the valley floor experience emerging ground water from glacial kettles. High water and flooding from the valley's rivers and streams flow into backwaters and over banks, becoming trapped and creating mosquito habitat.

Artificial mosquito habitats in Flathead County include retention and detention ponds, sewage treatment facilities, tire piles, and open containers such as buckets, wheelbarrows, abandoned hot tubs and uncovered boats. Storm drains, leaking sprinkler lines and unused wading pools also produce mosquitoes.

2. b. Pest Problem Description (target species)

Aedes vexans, commonly referred to as a floodwater mosquito, comprises about 70% of the District's total mosquito population according to Montana State University trap data (2005-2017). This species is an aggressive and opportunistic feeder. *Aedes vexans* is primarily considered a nuisance mosquito, but has been demonstrated to be a competent vector of West Nile Virus (WNV) and canine heartworm. Eggs from this species begin to hatch when water returns to their habitat and reaches temperatures of about 51° F. Although it has been published that eggs can lay dormant for 5-7 years, recent experience has shown this period may last much longer. Eggs are laid singly and must undergo a complete drying process before hatching.

Culex tarsalis represents the primary vector species for the potential transmission of West Nile Virus in Flathead County Montana. This species lays its eggs directly on the surface of the water in groups, called rafts. Rafts typically contain around 190 individual eggs, but may contain as many as 300. Permanent or semi-permanent areas of relatively clean water that are open to sunlight and supplied with an organic food source, such as grass, are the preferred habitat. As such, *Culex tarsalis* larvae are most often found in flooded areas of pastures, hay fields, parks, and overwatered lawns. These mosquitoes emerge later than most floodwater mosquito species and are typically encountered from May to September. Adult females are long-lived and can even overwinter in sheltered areas like basements or garages and lay their eggs in the spring.

Culex pipiens, larvae develop in foul water in rain barrels, catch basins, faulty cesspools, ditches, and other similar habitats. Generally known as the northern house mosquito, *Culex pipiens* infest houses and bite at night. Adult females pass the winter hibernating in cellars, basements, outbuildings, caves, and other places that provide protection from cold. Flight range is generally 1/2 mile or less. *Culex pipiens* are not common in Montana, but were found in the Flathead in 2008, and have established a persistent population. *Culex pipiens* is also a potential vector of West Nile Virus, and lays eggs in rafts of about 190 numerous times throughout the season.

Coquilletidia perturbans is a species specific to cattail marsh habitats. These mosquitoes do not frequently occur in most of Montana, but are common in the Flathead Valley. *Coquilletidia* larvae use special appendages to attach themselves to cattail stalks below the water's surface and use the hollow stalks as breathing tubes. The larvaes' positions on cattail stalks protect them from water disturbances and predators that affect the swimming larvae of other species and make them extremely difficult to find through normal larval surveillance methods. Some *Coquilletidia* larvae may even overwinter in a semi-dormant state while submerged. *Coquilletidia perturbans* can act as a vector for West Nile Virus.

These, and other, species have been identified as primary targets for control operations based on Centers for Disease Control (CDC) light trap collections, field observations and citizen complaints, which indicate high populations of these species within the District. This type of monitoring has been performed since 2006, and is the basis for determining where and when control measures will be applied. The presence of West Nile Virus is also monitored routinely, providing more information for making treatment decisions.

Focus areas for surveillance and control activities within the District are urban residential, city and county parks, recreational areas and rural residential upon request. Outreach and education about habitat reduction and bite prevention are also important focus areas, particularly for rural residents affected by large areas surrounding their properties.

3. Control Measures to Minimize Discharges

3. a. Pest Problem and Impacts

West Nile Virus, first introduced into the United States in 1999, is present in certain bird species and has been transmitted to humans and horses in the Flathead Valley. The primary vector species that can transmit the virus infest permanent or semi-permanent bodies of clean water in grassy areas (*Culex tarsalis)*, or may infest polluted waters such as brackish rain barrels, storm drains, and failed septic cesspools (*Culex pipiens).* Nuisance mosquitoes infest areas along rivers, parks and some residential areas in towns. Potential health threats, quality of life issues, and potential economic impacts are a few of the reasons for implementing mosquito control in Flathead County.

3. b. Tolerance levels to trigger pesticide application

Flathead County Mosquito Control field technicians respond to complaint calls by visiting the property in question. If flying mosquitoes are present, the source of the breeding activity (water body) will be investigated. Surveillance data collected from suspected sites include GPS location, water body size, larval dip counts, larval development stages, pupal dip counts, trap counts (from flying adults present on site) and pertinent comments.

3. c. Aerial Operations

Aerial application is a well-established and widely utilized practice in mosquito control due to the efficacy and efficiency of such treatments. Conventional aircraft are well suited to treating large, continuous areas, but are less suited to many of the treatment areas within the Flathead County Mosquito Control District. Unmanned Aircraft Systems (UASs), or "drones," represent versatile technologies that allow Flathead County Mosquito Control to incorporate the benefits of aerial operations in a cost-effective manner better suited to our treatment areas.

The Flathead County Mosquito Control District operates UASs for the purposes of monitoring flooding, examining the condition of known mosquito production sites, and locating production sites in areas of mosquito activity, as well as treating designated areas with low-toxicity larvicides or pupicides. UAS treatments are applied with properly calibrated equipment, and in full compliance with all federal and state regulations, as well as product label rates and restrictions. Such treatments are restricted to the application of larvicides and pupicides, with adulticide applications made via ground-based equipment. Staff UAS pilots licensed through the Federal Aviation Administration (FAA) conduct all flights, all aircraft are registered with the FAA, and all operations comply with FAA and airspace requirements. No flights or treatment applications shall be made to or over private property without landowner permission. Any and all UAS use must be consistent with this provision, but may not extend to monitoring or surveillance in any other manner, including but not limited to, law enforcement use, personal surveillance, or any other form of data/information collection inconsistent with this provision or the goals of the Pesticide Discharge Management Plan.

3. d. General Statement

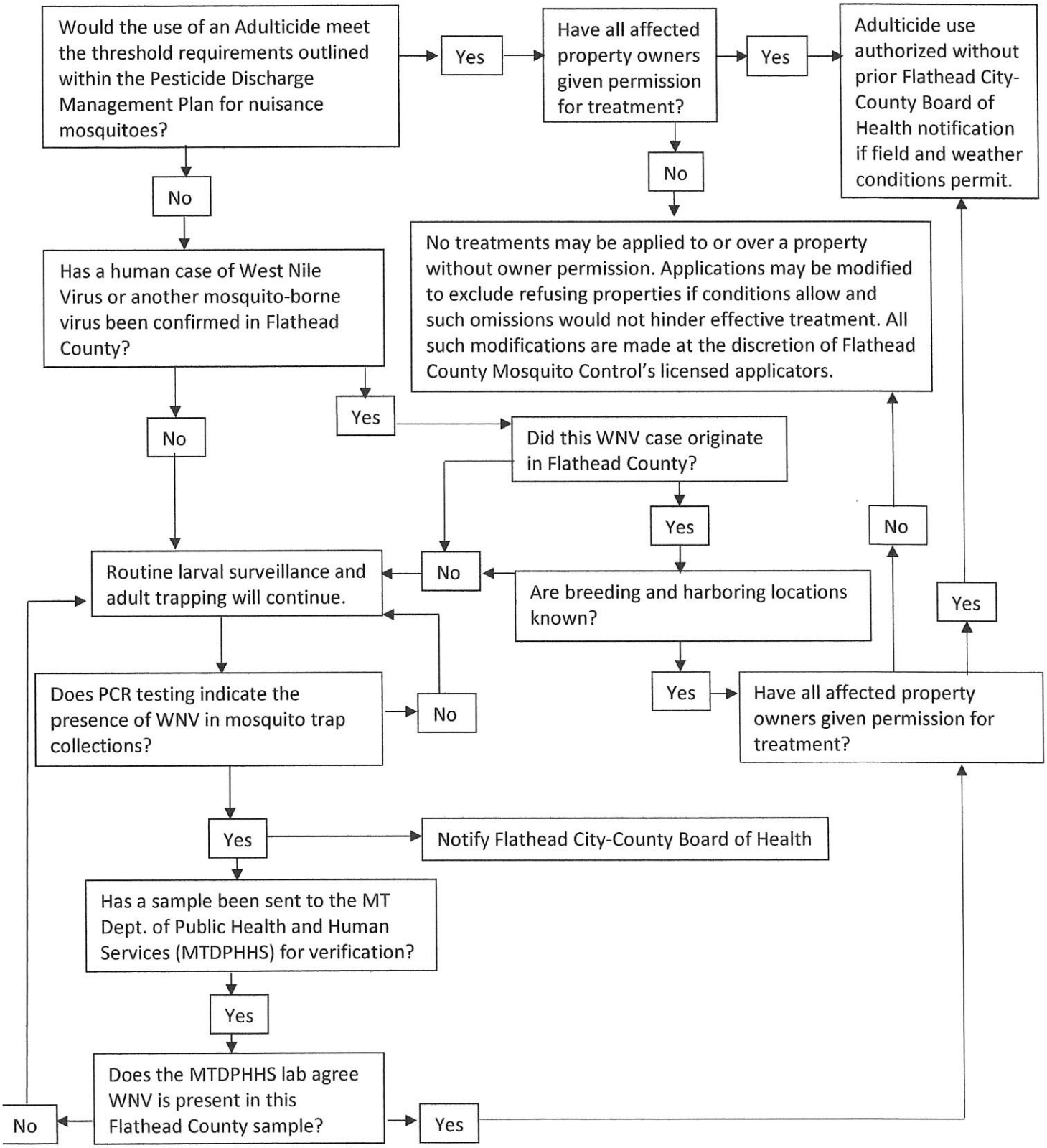
Flathead County Mosquito Control follows the common practices as described in Best Practices for Integrated Mosquito Management: A focused update (American Mosquito Control Association, November 2021). General information on control and surveillance, and the definitions used in the table below can be found in this document or in the most recent version of the Montana Mosquito Control Training Manual, published by the Montana Department of Agriculture.

Control Practices and Treatment Thresholds

Control Measure	Description	Applicability	Active Ingredient/ Formulation	Surveillance Method	Threshold	Application Method	Rate Determination
Source Reduction	Container control	Residential areas	N/A	Property checks, public education	Presence of water holding containers	N/A, Draining production sources	N/A
Larviciding	Use of EPA approved Larvicides	Areas of standing water known to be larval habitats of mosquitoes]	*Bacillus thuringiensis* S-Methoprene, *Bacillus sphaericus*, Spinosad Mineral Oil	Larval dipping	Presence of target species	Application with calibrated backpack or vehicle-mounted equipment	Lowest effective rate within label limits, with highest rate being used only when thick vegetation and organic material are present
Pupiciding	Use of EPA approved Pupicides	Areas of standing water found to contain mosquito pupae]	Mineral Oil	Pupal dipping	Presence of target species	Application with calibrated backpack or vehicle-mounted equipment	Lowest effective rate within label limits, with highest rate being used only when thick vegetation and organic material are present
Adulticiding (nuisance mosquitoes)	Use of EPA approved Adulticides	Used in urban and rural residential areas	Permethrin	CDC light trap	Trap Count of 150 adults per night. When weather or other conditions prevent treatment within ten days of a count, a new count will be completed to ensure that current mosquito levels warrant treatment.	Ground application w/calibrated vehicle-mounted Ultra Low Volume (ULV) equipment	Per product label and calibration
Adulticiding (vector mosquitoes)	Use of EPA approved Adulticides	Same as nuisance mosquitoes (above)	Same as nuisance mosquitoes(above)	CDC light trap, and PCR testing for the presence of West Nile Virus by Carroll College and the Montana Department of Public Health and Human Services.	Refer to Adulticide flowchart (following page)	Same as nuisance mosquitoes (above)	Same as nuisance mosquitoes (above)

Adulticide flowchart

The chart presented below defines the conditions under which adulticide treatments may be applied, and the steps followed to determine whether such treatments are necessary.



4. Schedules and Procedures

This section of the PDMP contains a list of the procedures used to implement the control measures described in Section 3 above and the schedules by which these procedures are performed. Mosquito control personnel will not access, inspect, or apply treatments to or over private property without the property owner's permission. This includes aerial inspection or treatment performed using Unmanned Aircraft Systems. If potential exists for treatment drift over neighboring properties, access and treatment permission will also be secured from all property owners who may be affected. Property owners who wish to be excluded from mosquito control activities may opt-out of treatments on the Flathead City-County Health Department website at: https://apps.flathead.mt.gov/donotspray/add.php , or by calling Flathead County Mosquito Control at (406) 751-8140 or (406) 751-8145. No applications will be made under unfavorable site or weather conditions likely to cause undesired drift or expose people to a potential treatment. All treatments are applied at the discretion of Flathead County Mosquito Control's licensed applicators and operators.

Control Method	Determination of Application Rate	Surveillance Method	Determination of Frequency of Application	Spill Prevention Procedures and Schedule	Application Equipment Calibration Schedule	Application Equipment Maintenance Schedule	Environmental Condition Assessment Procedure
Source Reduction	N/A	Dipping	N/A	N/A	N/A	N/A	Property owner/manager consulted
Larvicide	Lowest effective label rate. The presence of thick vegetation or heavy organic material in the water may necessitate use of the highest allowable rates.	Dipping/larval counts	Applications made when thresholds are exceeded and previous treatment is no longer effective.	Daily pre-trip inspections of equipment, mandatory chemical application training includes spill procedures.	Flow rate calibrated to employee and product at start of season. GPS utilized to monitor MPH travel rates on wheeled applicators and UAS.	Daily pre-trip inspections of equipment for leaks, cracks and operation. Pre-season inspections and repairs as required. Down equipment board denotes required repairs.	Onsite weather evaluations by trained applicators and operators. No applications made if wind is excessive. No application of mineral oil to areas of potential discharge into the Whitefish River.
Pupicide	Same as Larvicides	Dipping/pupal counts	Same as Larvicides	Same as Larvicides	Same as Larvicides	Same as Larvicides	Same as Larvicides, with the exception of areas of potential discharge into the Whitefish River where the application of oils is prohibited.
Adulticide	Calibrated rate does not exceed label application limits,	CDC Light Trap counts	Applications made when thresholds are exceeded, and in accordance with label limitations. All applications will be made at the discretion of Flathead County Mosquito Control's licensed applicators.	Daily pre-trip inspections of equipment, spill kits on vehicles, mandatory chemical application training includes spill procedures.	Pre-season certified calibration and subsequent use/acre evaluations.	Daily pre-trip inspections of equipment for leaks, cracks and operation. Pre-season inspections and repairs as required. Equipment log denotes required maintenance and repairs.	GPI weather forecast monitored in advance. Onsite weather evaluations by trained applicators. No applications to areas with people present and without the consent of all affected stakeholders. Consideration will be given to natural pollinators. No applications if wind speed exceeds 5 mph or drift is likely to impact non-target areas. All applications will be made at the discretion of Flathead County Mosquito Control's licensed applicators.

This Pesticide Discharge Management Plan will be reviewed and updated once per calendar year, or whenever necessary to update the pest problem identified and pest management strategies evaluated for the **Flathead County Mosquito Control District.**

_____ _____

FCMCD Representative **Date**

_____ _____

Flathead City-County Board of Health Chairperson **Date**

Final Draft

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Flathead County Mosquito Control District

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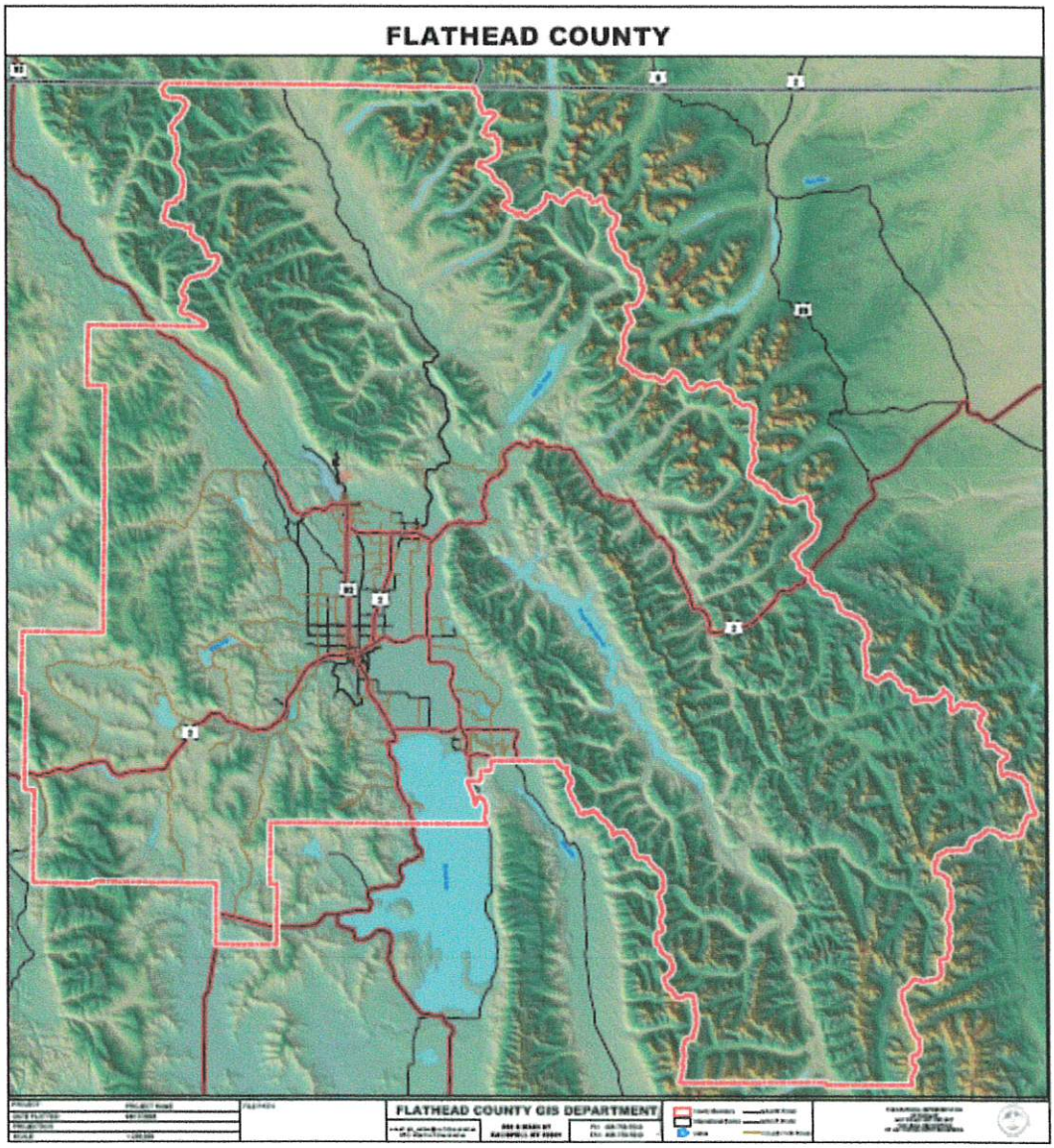

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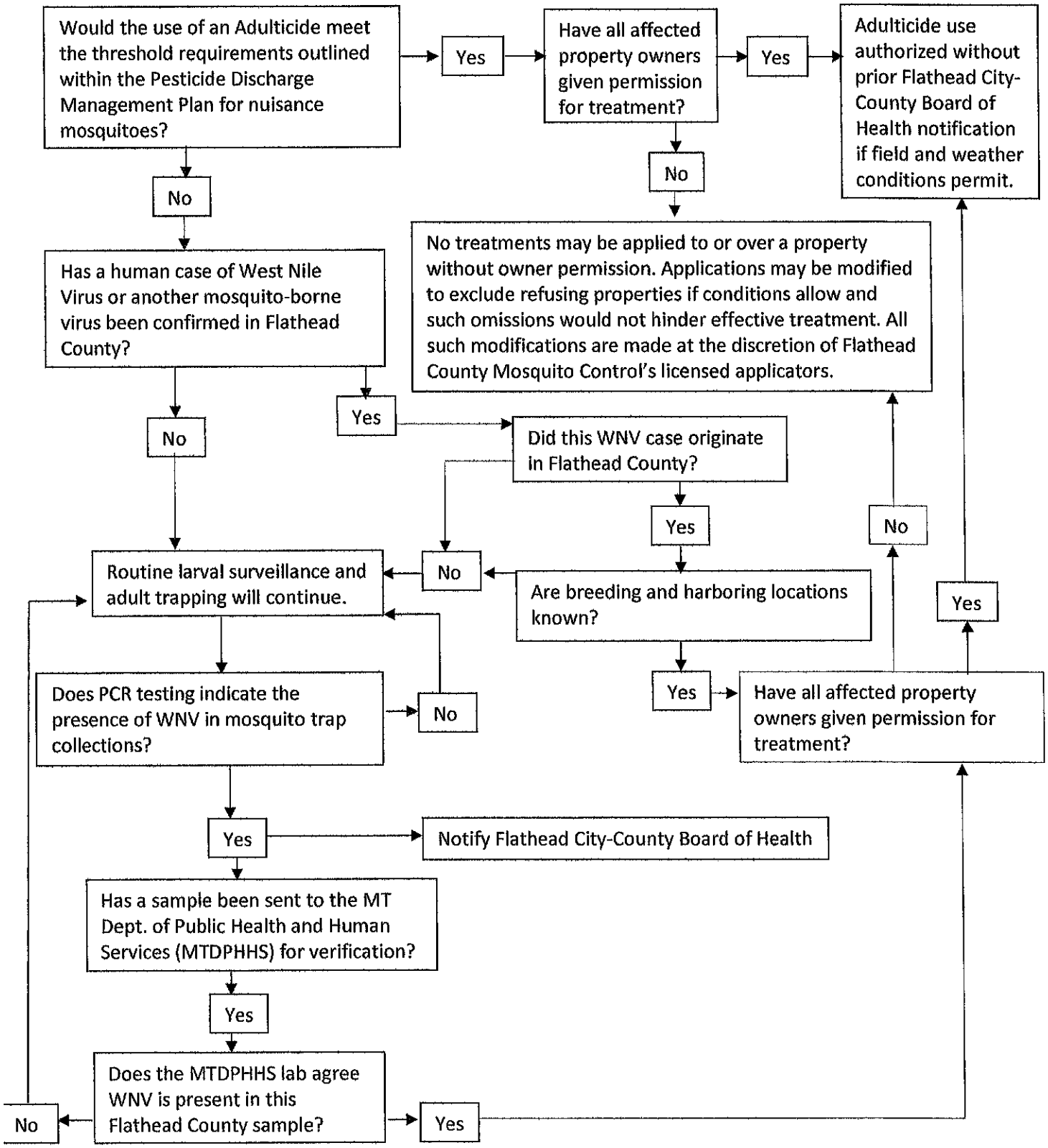

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Pupicide	Same as Larvicides	Dipping/pupal counts	Same as Larvicides	Same as Larvicides	Same as Larvicides	Same as Larvicides	Same as Larvicides, except for areas of potential discharge into the Whitefish River where the application of oils is prohibited.
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FCMCD Representative	**Date**
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